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**Remarks**

The applicants have corrected the dependency of claims 6 and 7 and also the objection relating to claim 15. Claims 20 and 21 have been cancelled.

The applicants respectfully submit that the Examiners interpretation of the applicant's claim language regarding intention is far-fetched. The claims have to be interpreted as they would be understood by one of ordinary skill in the art. For example, if one gives an instruction to an artisan to "heat a metal to soften it", he would understand by that instruction that he was intended to heat the metal until it became soft, not merely that he was instructed to heat it some arbitrary amount with the intention of it becoming soft regardless of whether or not it became soft. Such an interpretation is, in the applicant's respectful submission, taking pedantry to the extreme.

However, in view of the Examiner's unnatural position that subjecting something to a treatment to achieve a stated result relies on intent rather than the fact that the result is achieved, the applicants have re-arranged the wording in claim 1 to make it clear that the acts of relieving the stress are positively recited as manipulative steps necessary to achieve the overall result of improved quality waveguides. The stated result is now positively recited as a limitation of the claim in language that cannot be interpreted as an intention. The applicants have also recited that the steps are carried out in sequence.

Also, the applicants have included the step of adding the cladding to make it clear that the core layer is indeed a core. In reality, it is believed that persons skilled in the art would refer to the layer that was intended to be the core layer as the "core layer" (and this would be recognizable by its different refractive index) even before the cladding was added, but the amended wording avoids this difficulty noted by the Examiner.

The applicants have established by extensive research detailed in the disclosure how to reduce stress-related mechanical problems in optical waveguides. The applicant's disclosure explains in detail how certain harmonic oscillators cause problems and how subjecting the wafer to specialized thermal treatments described in Figure 18 can eliminate these problems. Yet, the Examiner maintains that the invention, which has resulted from extensive and detailed research into the nature of the problem, is obvious over a simple patent, Grant, that has absolutely nothing

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whatsoever to do with the invention and merely discloses depositing the cladding layer of BSG in multiple stages with an anneal between each stage to avoid the overhand problem you get when depositing the cladding layer over the core. In the applicant's view, the Examiner is taking a very artificial position unrelated to reality in the field.

For one thing, consistent with the caselaw Grant could be regarded as non-analogous art because it deals with an entirely different problem, namely problems in the formation of the cladding layer due to overhangs. In this connection, claim 1 has now been directed to a method of making optical quality components with a plurality of layers having different refractive indices with reduced stress-induced mechanical problems (see page 1, line 21).

The Federal circuit stated in *In re Wood*, 202 USPQ 171, that

"we presume knowledge by the inventor of all the prior art in the field of his endeavour. However, with regard to prior art outside the field of his endeavor, we presume knowledge from those arts reasonably pertinent to the particular problem with which the inventor was involved." (emphasis added)

And in *In re Clay*, 23 USPQ 2d 1058, the Federal circuit stated:

[a] reference is reasonably pertinent if ... it is one which, because of the matter with which it deals, logically would have commended itself to the inventor's attention in considering his problem... If a reference has the same purpose as the claimed invention, the reference relates to the same problem... [I]f it is directed to a different purpose, the inventor would accordingly have less motivation or occasion to consider it."

The Examiner claims that step a) is disclosed in Grant at col 1, lines 25-29. However, this passage says nothing about depositing a buffer layer on a front and back surface of a silicon wafer, so this position is respectfully traversed. Step a) is not disclosed in Grant because he only discloses depositing a (namely a single) buffer layer on a substrate (namely on one side of the substrate (see Figure). It is not permissible to read more into a reference than is actually taught either inherently or expressly. It is therefore not true to say that step a) is disclosed in Grant.

The Examiner indicates that Ohja is not a "combination of the references per se, rather Ohja is relied on merely as evidence as to what is already known/typical" This statement is not understood. There is no evidence that Ohja is typical or that it should be given any special treatment different from any other reference, and the applicants expressly challenge such

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assertion. This position of the Examiner is therefore respectfully traversed. The applicants do not accept that Ohja is "typical" of any particular process. The applicants only accept that Ohja represents a disclosure of one particular prior art process. Ohja could be highly atypical.

To the extent that Ohja is a valid reference, the Examiner must show that the references, when combined, teach the invention as claimed, and that furthermore there is a valid motivation to combine the references.

The Examiner states on page 5 of the office action that "Grant discloses the "invention as claimed except for the layer on the reverse of the layer". That statement is not surprising given the way the Examiner has interpreted the claim because he has ignored most of the limitations in claim 1 that relate to the invention as described in the application. As apparent from the disclosure, the stress relief sequence is very important to achieve the desired results. For example, the Examiner has dismissed former limitations c and f as "not being individual steps". There is no requirement that each item in a claim constitute an individual step. For example, there is no objection to referring generally to a first thermal treatment, and then defining the first thermal treatment more specifically in a subsequent clause. The subsequent clause is still a valid claim limitation. Former item c qualifies the first thermal treatment referred to in step b, and all the limitations in claim 1 relating to the nature of the first thermal treatment must be taken into account. These limitations are necessary in order to achieve the stress-relief effects described in the application. However, for clarity, former items c and f have now been subsumed into manipulative steps b and d. Grant actually teaches very little about the formation of the buffer and core layers because he is only concerned with the deposition of the cladding layer.

Ojha does disclose putting a buffer layer on the backside of the wafer to reduce warp. However, he does not disclose subjecting the wafer with the buffer layers on the front and back faces to the first thermal treatment, as more fully defined in claim 1, prior to depositing the core layer. The Examiner has ignored the sequence of steps, and this is also important to achieve the results claimed. Please note in Ohja that the core layer is deposited before the anneal takes place (see, for example, col. 4, line 5). Such action gives rise to precisely the sort of stress-induced mechanical problems that the invention seeks to avoid.

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The prior art clearly does not teach the invention described. The Examiner's problems seem to arise because of the way the Examiner is interpreting the claim language. While it is legitimate to give the language its broadest reasonable interpretation, it is important to bear in mind the word reasonable. The English language can often be stretched to have far-fetched meanings. That is not what claim interpretation is about. Claims are meant to be interpreted as they would be understood by practical persons skilled in the art. It is believed that the amended claim language avoids these linguistic problems, and that when due weight is given to the legitimate claim limitations, the Examiner will recognize that the invention, which relates to a particular series of manipulative steps based on a deep understanding of the internal processes within silica waveguides, is not obvious over patents that in no way discuss or recognize these problems. The invention substantially reduces stress-induced problems in optical waveguides relative to prior art processes, including those cited by the Examiner.

With regard to the parameters defined in the dependent claims, the Examiner has mostly just dismissed them outright as design choice or routine experimentation. This is a standard technique on the part of Examiners. However, such an objection only applies when the parameters specified have not been shown to have any special significance. On the contrary, in the present instance, the discussion relating to Figure 10 shows how following the treatment of the invention improved optical quality films with reduced mechanical stress can be obtained. It is therefore improper to dismiss such claims as being mere design choice. This rejection is respectfully traversed.

Reconsideration and allowance are therefore respectfully requested.

Respectfully submitted,



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